



SUSAN BOYER (K8476-1)

# Chicory Mops Up After Turkey Litter

**C**hicory may be just the plant to clean up nutrients leached from turkey litter compost used to fertilize pastures.

"Turkey litter is the nitrogen- and phosphorus-rich manure cleaned from turkey houses along with the wood shavings used as bedding," says agronomist David P. Belesky. "When spread at high rates, it looks like chipboard on the ground."

Sometimes, however, there are more nutrients in that litter than plants can use, and this may pose problems for water quality.

"We're finding that chicory could be a biological sponge that soaks up the excess nitrogen and other nutrients from the soil," says Belesky, who is based at ARS' Appalachian Farming Systems Research Center in Beaver, West Virginia.

For the past 4 years, Belesky and colleagues have been testing three varieties of chicory—Grasslands Puna, Forage Feast, and Lacerta—on Appalachian pastures. They want to see whether the chicory can boost cattle and sheep production, as well as catch excess nutrients and improve marginal soil.

"Chicory has a big taproot, like a parsnip or carrot. This taproot could break up soil layers that block other roots," says Belesky.

The taproot may also help the plant go deep for water, which would explain in part why chicory "stayed green and leafy when most other pasture plants stopped growing during last year's hot, dry summer."

Belesky found the chicory could keep soaking up nitrogen and respond to commercial nitrogen fertilizer application rates as high as 424 pounds an acre. Now he is testing composted turkey litter as fertilizer.

The tests are part of a project involving many of the lab's scientists—with specialties ranging from plant nutrition to groundwater quality—as well as British United Turkey of America, a turkey-production firm with breeding operations in

southern West Virginia.

Farmers often stockpile the litter in the fall and apply it to their fields in spring. Recommended rates are under 3 tons an acre.

The only major problem with chicory grown in mixture with other pasture plants, Belesky says, is that lambs choose the other plants before eating chicory.

Lab tests by ARS animal scientist Kenneth E. Turner led him to speculate that the high amounts of nitrogen mopped up by the plants might cause a buildup of compounds that temporarily retard digestive microbes in the lambs' rumens. This concept hasn't been tested on cattle yet.

ARS chemist Joyce G. Foster is studying the chemical make-up of the chicory plants to see whether they hold something objectionable to the lambs.

Since scientists in New Zealand have had success with Puna chicory grazed by sheep as well as cattle, Belesky suspects climate plays a role, along with fertilizer and management practices.

ARS hydrologist Douglas G. Boyer is analyzing soil water to be sure that chicory isn't allowing significant amounts of nitrate to escape.

The scientists are also working with USDA's Natural Resources Conservation Service to test chicory in the Southern West Virginia Grazinglands Program. They see potential in chicory to provide forage in summer and increased protein to improve per-acre production of beef and lamb.—By **Don Comis**, ARS.

*This research is part of Grazinglands Management, an ARS National Program described on the World Wide Web at <http://www.nps.ars.usda.gov/programs/nrsas.htm>.*

*David P. Belesky, Kenneth E. Turner, Joyce G. Foster, and Douglas G. Boyer are at the USDA-ARS Appalachian Farming Systems Research Center, 1224 Airport Rd., Beaver, WV 25813-9423; phone (304) 256-2858, fax (304) 256-2921, e-mail [dbelesky@asrr.arsusda.gov](mailto:dbelesky@asrr.arsusda.gov).* ♦